PrimeGrid's
Generalized Fermat Prime Search

On 5 October 2024, 19:55:34 UTC, PrimeGrid's Generalized Fermat Prime Search found the Mega Prime:

$$11937916^{524288} + 1$$

The prime is 3,710,349 digits long and will enter "The Largest Known Primes Database" (https://t5k.org/primes) ranked 13th for Generalized Fermat primes and 88th overall.

The discovery was made by Murray Sondergard of Canada using an NVIDIA GeForce GTX 1080 Ti in an Intel(R) Core(TM) i7-5960X @ 3.00GHz with 16GB RAM, running Microsoft Windows 10 Professional x64 Edition. This computer took about 1 hour, 21 minutes to complete the probable prime (PRP) test using Genefer22. Murray Sondergard is a member of the Canada team.

The PRP was confirmed prime on 7 October 2024 by an AMD Ryzen 9 7950X3D @ 4.20GHz with 128GB RAM, running Debian 12.5. This computer took about 14 hours, 18 minutes to complete the primality test using LLR.

The credits for the discovery are as follows:

1. Murray Sondergard (Canada), discoverer
2. PrimeGrid, et al.
3. AthGFNSieve, sieve program developed by David Underbakke
4. GFNSvCUDA, sieve program developed by Anand Nair
5. Genefer22, probable prime program developed by Yves Gallot
6. LLR, primality program developed by Jean Penné

Entry in "The Largest Known Primes Database" can be found here:
https://t5k.org/primes/page.php?id=138627

Using a single PC would have taken years to find this prime. So this timely discovery would not have been possible without the hundreds of volunteers who contributed their spare CPU cycles. A special thanks to everyone who offered their advice and/or computing power to the search - especially Yves Gallot, Iain Bethune, David Underbakke, Anand Nair, Mark Rodenkirch and Geoff Reynolds who were major forces in moving the project forward. Also, thank you to all the sievers, especially Honza Cholt and Jim Breslin. A final thanks to Michael Goetz for porting to BOINC.

The Generalized Fermat Prime Search will continue to seek even larger primes. To join the search please visit PrimeGrid: https://www.primegrid.com

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About PrimeGrid

PrimeGrid is a distributed computing project, developed by Rytis Slatkevičius and currently managed by Tyler Bredl, Scott Brown, Michael Goetz, Darren Li, Dao Heng Liu, Reginald McLean, Rytis Slatkevičius, Roman Trunov, and Christian Wallbaum.

PrimeGrid utilizes BOINC to search for primes with the primary goal of bringing the excitement of prime finding to the "everyday" computer user. Simply download the software and let your computer do the rest. Participants can choose from a variety of prime forms to search. With a little patience, you may find a large or even record-breaking prime.

BOINC

The Berkeley Open Infrastructure for Network Computing (BOINC) is a software platform for distributed computing using volunteered computer resources. It allows users to participate in multiple distributed computing projects through a single program. Currently BOINC is being developed by a team based at the University of California, Berkeley led by David Anderson.

This platform currently supports projects from biology to math to astronomy. For more information, please visit BOINC: https://boinc.berkeley.edu/

For more information about PrimeGrid and a complete list of available prime search projects, please visit: https://www.primegrid.com